

RESEARCH ARTICLE

***On-Farm* Diversity Assessment and Participatory Varietal Evaluation of Cold-Tolerant Rice in Mid-Hills of Nepal**

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Abstract

Drawing upon consequentially growing food insecurity in mid-hills attributed to poor adoption levels *inter alia* inflicted by narrow range of locally adaptive farmer's preferred cold tolerant rice varietal options in national agricultural system, the present study was undertaken. We conducted *on farm* diversity assessment of 60 high altitude rice genotypes from *ex-situ* and *on farm* employing un-replicated diversity block in 2015. Subsequently, we identified eight promising locally adaptive genotypes as candidate genotypes based on the inferences of diversity block trial and evaluated them through participatory variety selection (PVS) using randomized block design in 2016 under on-farm conditions. Our studies revealed marked diversity among the Nepalese cold-tolerant rice genotypes. The UPGMA cluster analysis categorized the 60 genotypes into six distinct clusters. Strong positive correlation between grain yield and plant height; panicle length; straw yield and strong negative correlation between grain yield and 1000-grain weight was detected. PCA suggested traits viz., plant height, panicle length, days to 50% heading, and grain yield to be principal discriminatory characteristics of the cold-tolerant rice. Seto Kattike, Naulo Dhan, and Borang were most promising and adaptive genotypes whose eminence were justifiably corroborated and validated by farmer's overall evaluation. The most valued farmer's selection criteria were grain and straw yield, earliness, disease resistance, and stem borer tolerance. The findings bolster employment of novel and proven participatory plant breeding approach using diversity kits and IRD kits to expand and promote varietal choice options for immediate benefits to the farmers and facilitate rapid varietal release and registration.

Key words : Participatory varietal selection, cold-tolerant rice, diversity assessment, evaluation, Nepal

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